



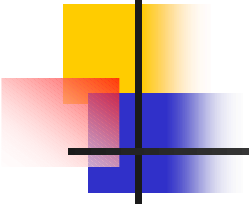
Colorado Statewide Digital Trunked Radio System

Why, How & When



DTR Timeline

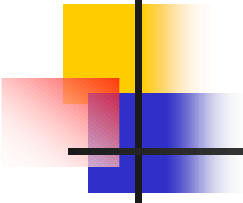
1991	<u>1991 Long Bill footnote</u>
1992	<u>Legislative Audit</u>
1993	<u>Users Group Formed</u>
1994	<u>FCC Releases NPSPAC 800 MHZ Channels</u>
1995	<u>State Plan DTRS Completed</u>
1996	<u>Project 25 CAI Standard Released</u>
1997	<u>Technology/ Spectrum Released</u>
1998	<u>IMC & OIT Review and approval</u>
1999	<u>IMC Review and approval</u>
2000	<u>Technology/ Spectrum Testing</u>
2001	<u>LG Partnership Agreement</u>
2002	<u>HB 98-1068 Public Safety Communications Trust Fund</u>
2003	<u>\$3.1M funded for Pilot</u>
2004	<u>RFP Issued</u>
2005	<u>Contract Awarded to Motorola</u>
	<u>Pilot Phase (Metro)</u>
	<u>Statewide Build Out Phase 1</u>
	<u>Statewide Build Out Phase 2</u>
	<u>Statewide Build Out Phase 3</u>
	<u>Homeland Security Grants</u>
	<u>SLV Phase completed</u>
	<u>DOLA WTN Grants</u>
	<u>DHS Interoperable Continuum</u>



1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Longbill Footnote 7

“Division of Telecommunications, Information Management Commission are requested to assist the State Patrol in developing a statewide telecommunications plan to replace and update the current system, This plan should examine the cost-effectiveness of funding the replacement in one payment versus phasing the costs over several years, as well as the costs and benefits of consolidating the seventeen dispatch centers in the state. This plan should address the personal services savings that could be achieved if the state were to consolidate the centers and how these savings could offset the cost of a new system.”

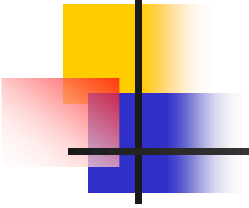


1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Legislative Audit Report

“According to our consultant, the technology is old, costly and inefficient. This public safety network, which supports about 6,700 mobile radios, is based on analog technology, which does not allow interagency communications or sharing of resources.”

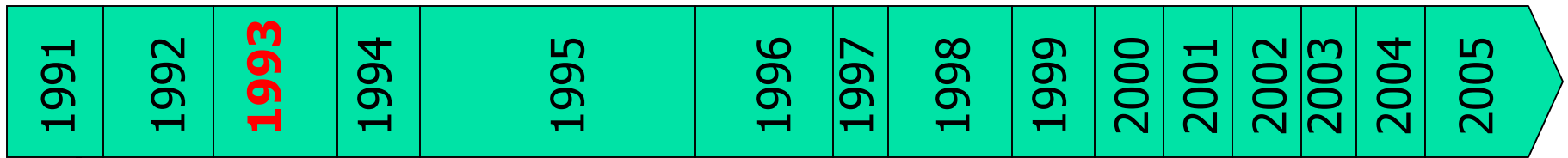
“Communications for public safety agencies is of great importance. These agencies need reliable, effective equipment. Although a replacement system is costly, we believe the Division should continue to analyze how to improve the public safety two-way radio network.”



1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

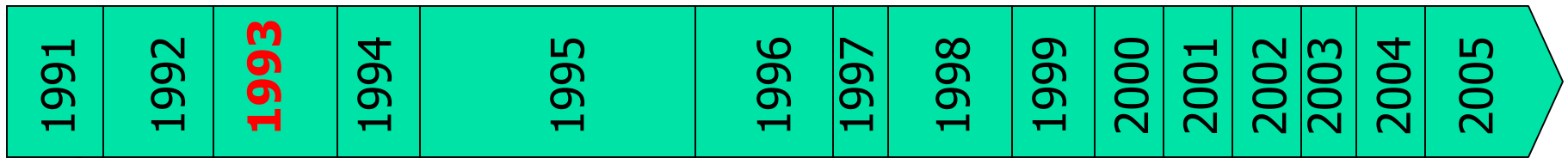
Statewide Informational Meetings

- Over 20 meetings held in all areas of the State
- Meetings with affected associations & groups
 - Association of Public Safety Communications Officials (APCO)
 - County Sheriffs of Colorado
 - Colorado Counties Inc
 - Colorado Fire Chiefs Association
 - Colorado EMS Council
- Overview of footnote 7
- System Concept
 - New Technology
 - Single State Wide System
 - Develop System and User Requirements
 - State and Local Government Agencies
- Seek input and members for users group



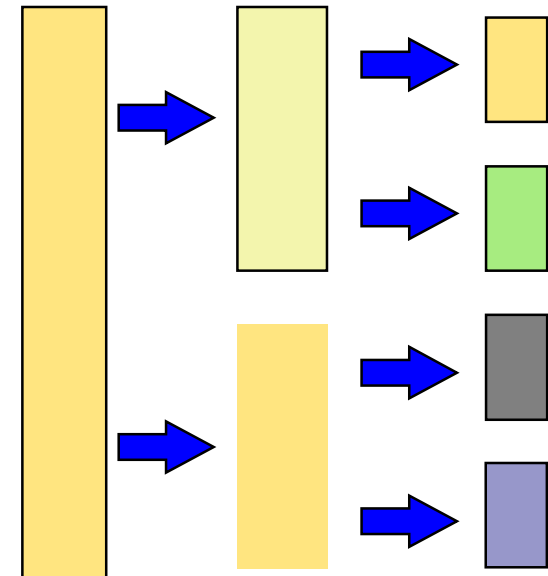
Users Group Formed

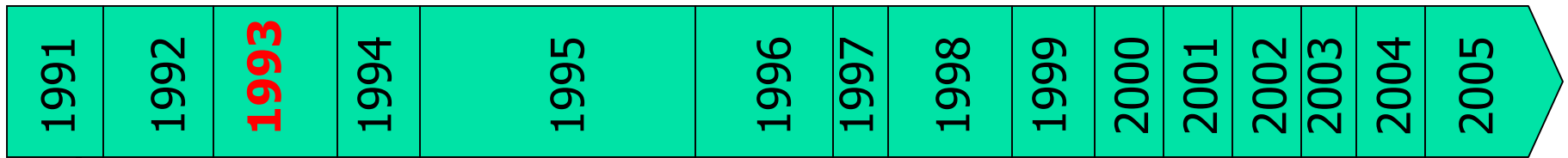
- Develop the operational and system requirements
 - Technology neutral
 - No cost barrier
- Open to State, Local or Federal Government
- Vendors allowed to participate on a limited basis
- Steering committee
 - Operational & System Requirements Committee
 - Technical Committee
 - Funding & Fees Committee



FCC Narrowband proceeding

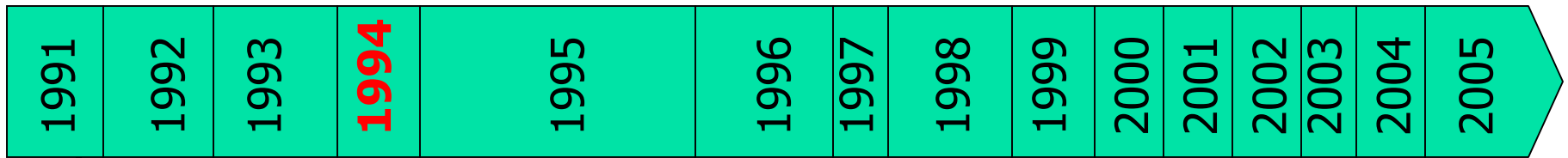
- Reducing transmitter power
 - 40 KM radius (25 miles)
- Consolidation of radio services
- Re-Farming or Narrow Banding
 - UHF 25KHz to 12.5 KHz
 - VHF 15Khz to 12.5 KHz
 - Future split to 6.25KHz
- Proposed date January 2005
- Would require replacement of all existing equipment
- Applies to all frequency band below 800 MHz





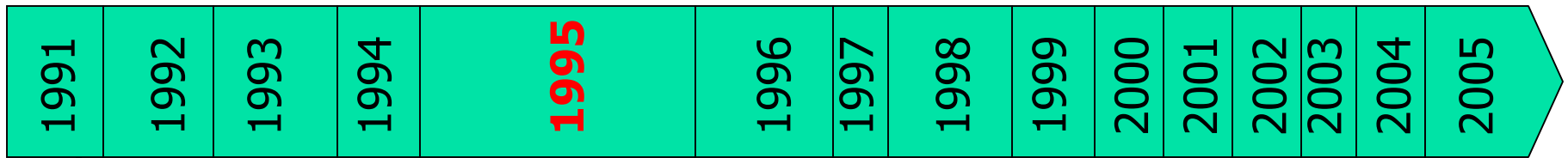
NPSPAC 800 MHz. Channels

- FCC releases 220 channels in in the 800 MHz band
- Allocated specifically for public safety
- Required State plan to include allocation process and use.
- Clear spectrum
- Designated 5 channels for nationwide interoperability.



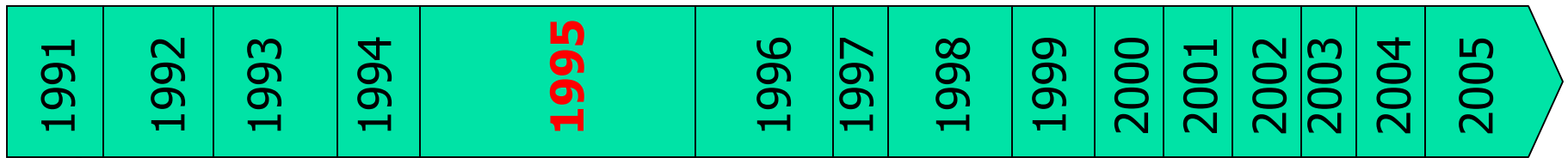
State Plan Completed

- History and Background
- Existing Systems Description
- Users Group
- Trunking
 - Operational Requirements
 - Standards
 - Management and Control
 - Shared Use of System
- State Patrol Communications Center Consolidation
- Project Schedule
- System Cost and Funding
- System Maintenance



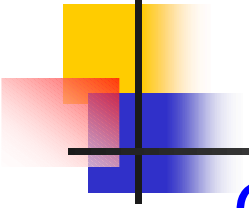
Project 25 Common Air Interface Released

- Project 25 open standard for digital public safety radio systems
- Full suite of Standards under development
- Adopted by Telecommunications Industry Association (TIA)
- Adopted by Federal Government
- Backward compatible with analog system
- Software based
- Upgradeable for future technology and applications.
- Formally adopted by the State Users Group



Technology & Spectrum Testing

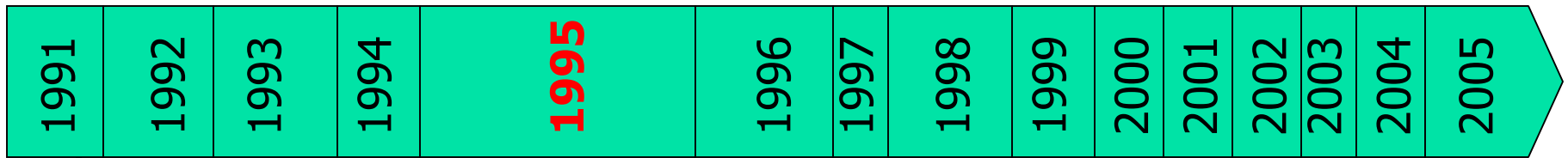
- Evaluate analog and digital technology
- Evaluate VHF and 800 MHz Spectrum
- Testing in various environments, terrain and seasons
- Side by side Test
 - Analog VHF (digital VHF equipment was not developed)
 - Analog 800
 - Digital 800
- Signal strength
- Voice quality
- Voice recognition
- 800 MHz digital out performed VHF or 800 analog in all cases.



1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
------	------	------	------	-------------	------	------	------	------	------	------	------	------	------	------

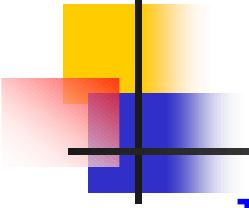
Consult with other Public Safety, State & Federal Agencies

- State of Michigan
- State of Ohio
- Department of Treasury
- Department of Justice
- National Institute of Standards & Technology (NIST)
- Shared Colorado plan with over 30 other states, and 6 countries.
- Presented Colorado plan at over 20 local and national forums.



NIST Review

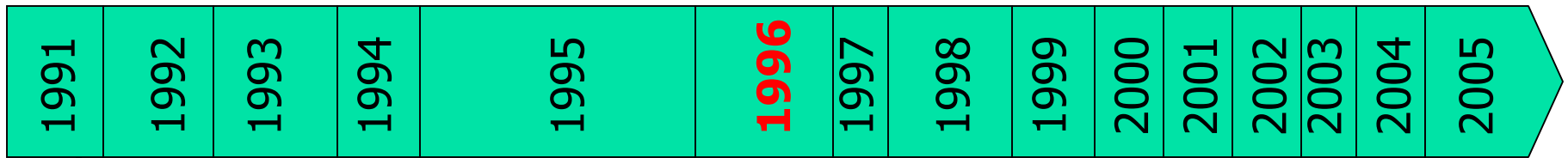
- Validate technology & spectrum test results
- Impartial Opinion
- FCC narrow banding impact
- Developed computer propagation models
- Participated in field testing
- Confirmed field testing results
- Modified computer models to match field tests
- Agreed 800 MHz digital was the best solution for a new statewide system



1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
------	------	------	------	-------------	------	------	------	------	------	------	------	------	------	------

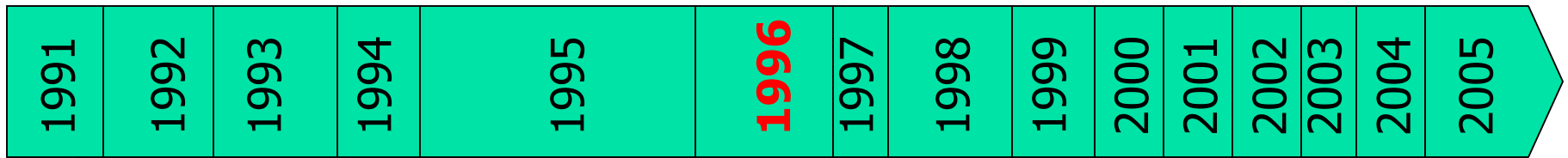
Information Management Commission/Office of Innovation & Technology Review and Approval

- Presentation of DTR Plan to IMC & OIT
- Phase 1 budget request - \$17 million
- DTR plan approved with no changes
- Recommend for funding
- Funding not approved by legislature



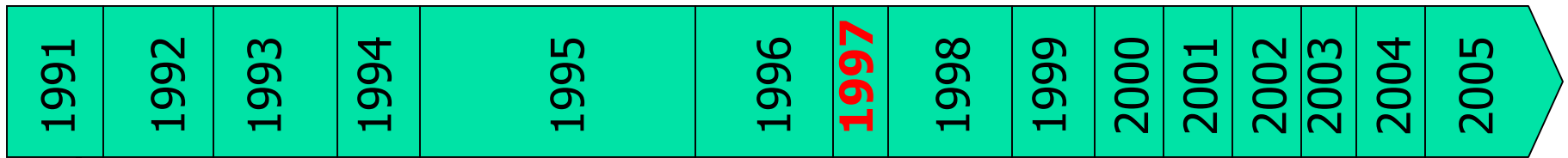
IMC Review & Approval

- Reduce budget request to \$3.1 million for pilot phase.
- DTR plan approved as is
- Recommend for funding
- Funding not approved by legislature



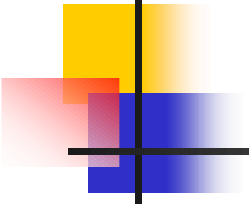
Technology & Spectrum Testing

- Further testing of new equipment & technology
- Continued evaluation VHF and 800 MHz Spectrum
- Assisted local government agencies with local testing
- Reconfirmed 800 Digital solution



Local Government Partnerships

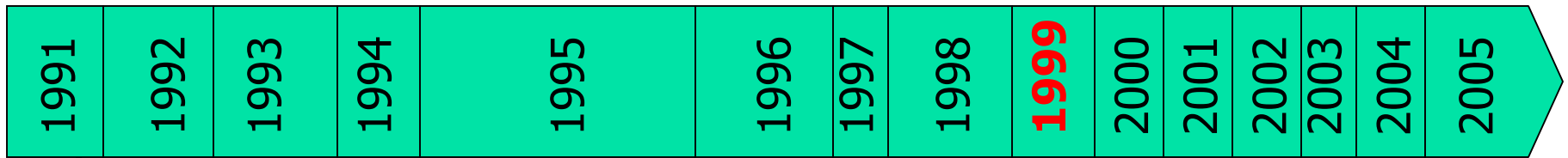
- Several local governments planning new systems
 - Arapahoe County 800 MHz Analog
 - Douglas County 800 MHz digital
 - Jefferson County 800 MHz digital
 - Eagle County 800 MHz digital
- Effort to shared infrastructure and interconnect systems
- Formally agreement (beginning of CCNC)
 - State
 - Arapahoe County
 - Douglas County
 - Jefferson County



1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
------	------	------	------	------	------	------	-------------	------	------	------	------	------	------	------

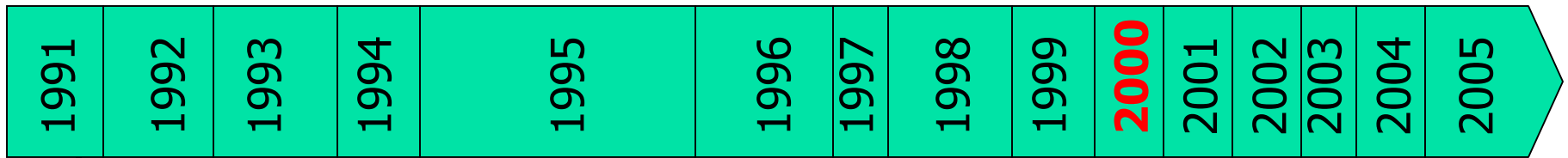
HB 98-1068 Public Safety Communications Trust Fund

- Long Range Plan
- Adopt Rules on Distribution and Repayment of Moneys
- Adopt Recommended Standards
- Analog to Digital Conversion
- \$3.3 Million Appropriation



RFP Issued

- Project 25 Standards
- Trunking
- 800 MHz
- Digital
- Fully upgradeable during multi phases
- Compliant with HB 98-1068 provisions
- Contract awarded to Motorola
- Award appeal filed by Ericsson (MA/Com)
- Appeal denied



Phase 1 (Pilot)

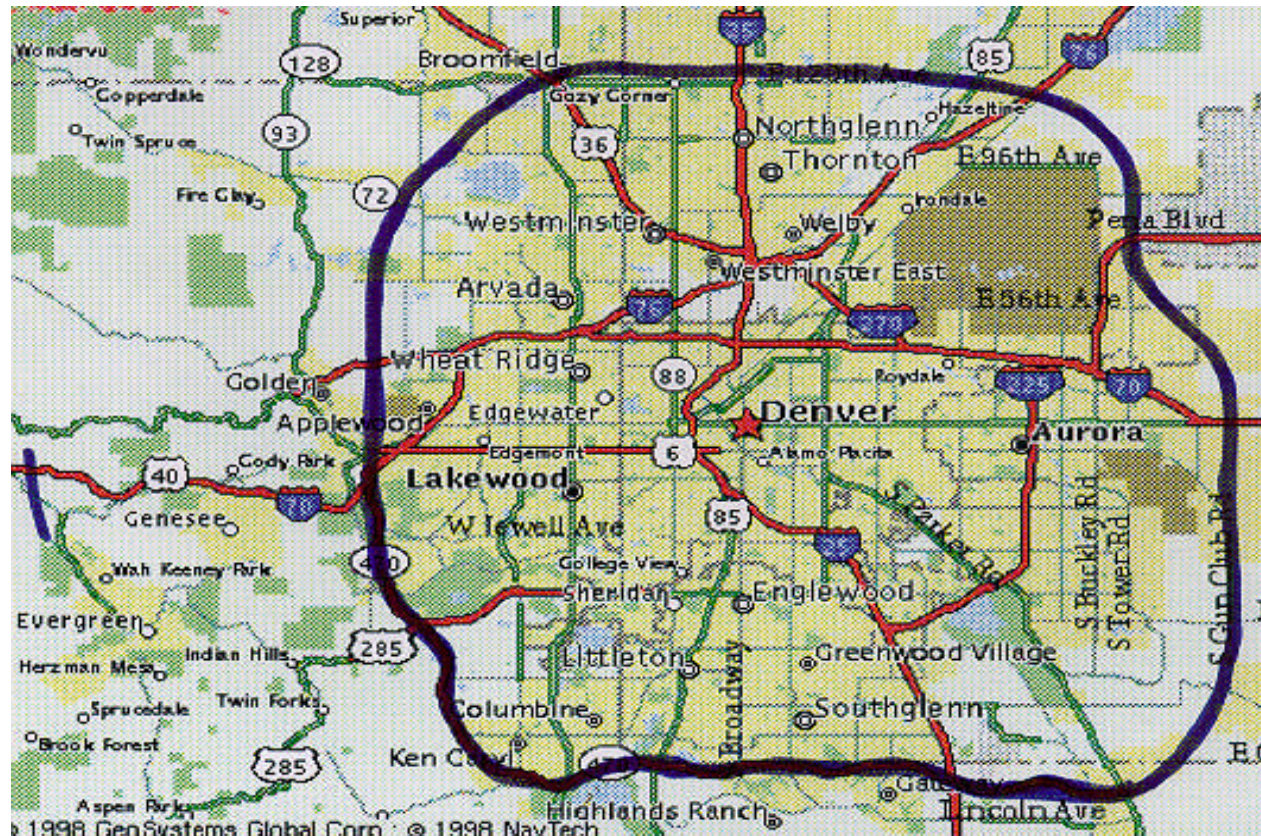
- Metro Agencies
 - Combined Communications System MOU(CCNC)
 - Arapahoe County
 - Aurora
 - Douglas County *
 - Jefferson County *
 - State of Colorado *

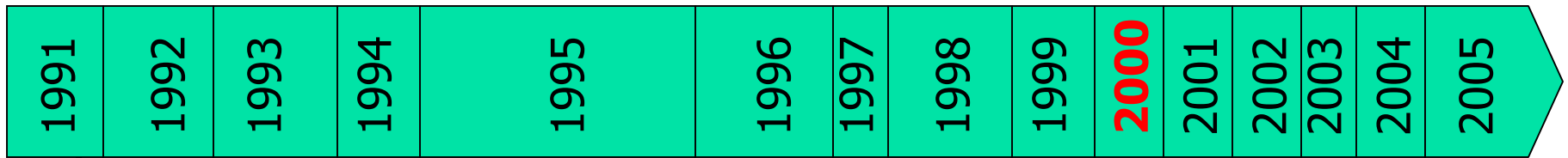
* Pilot 1 infrastructure partners

■

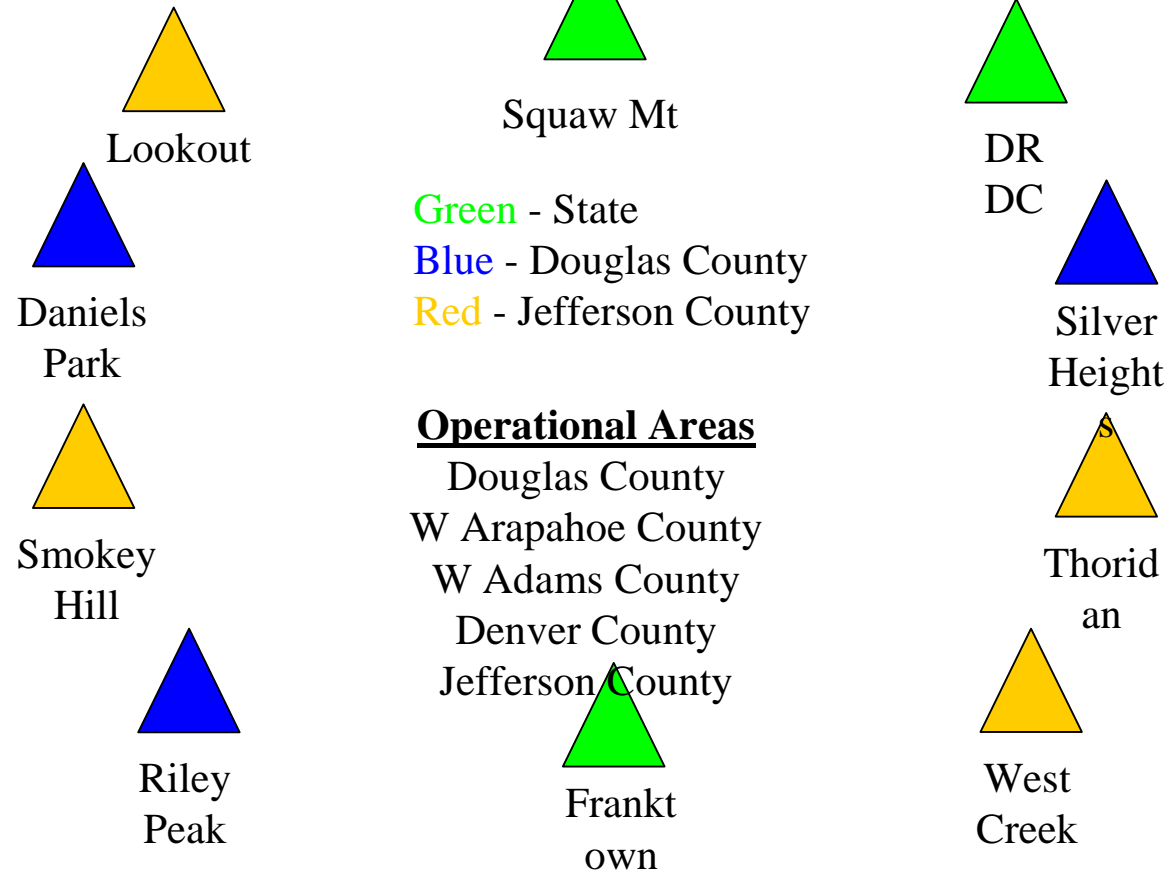
1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

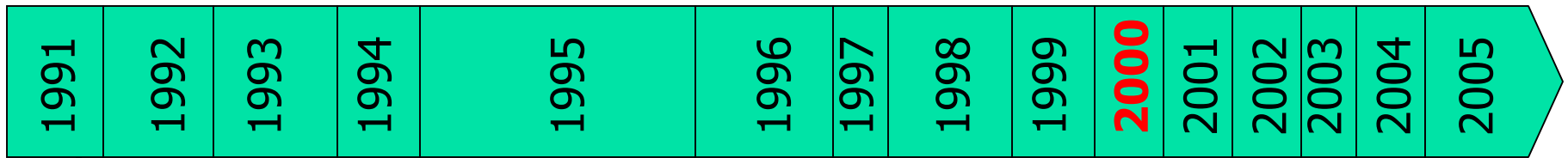
Phase 1 (Pilot) Coverage Area



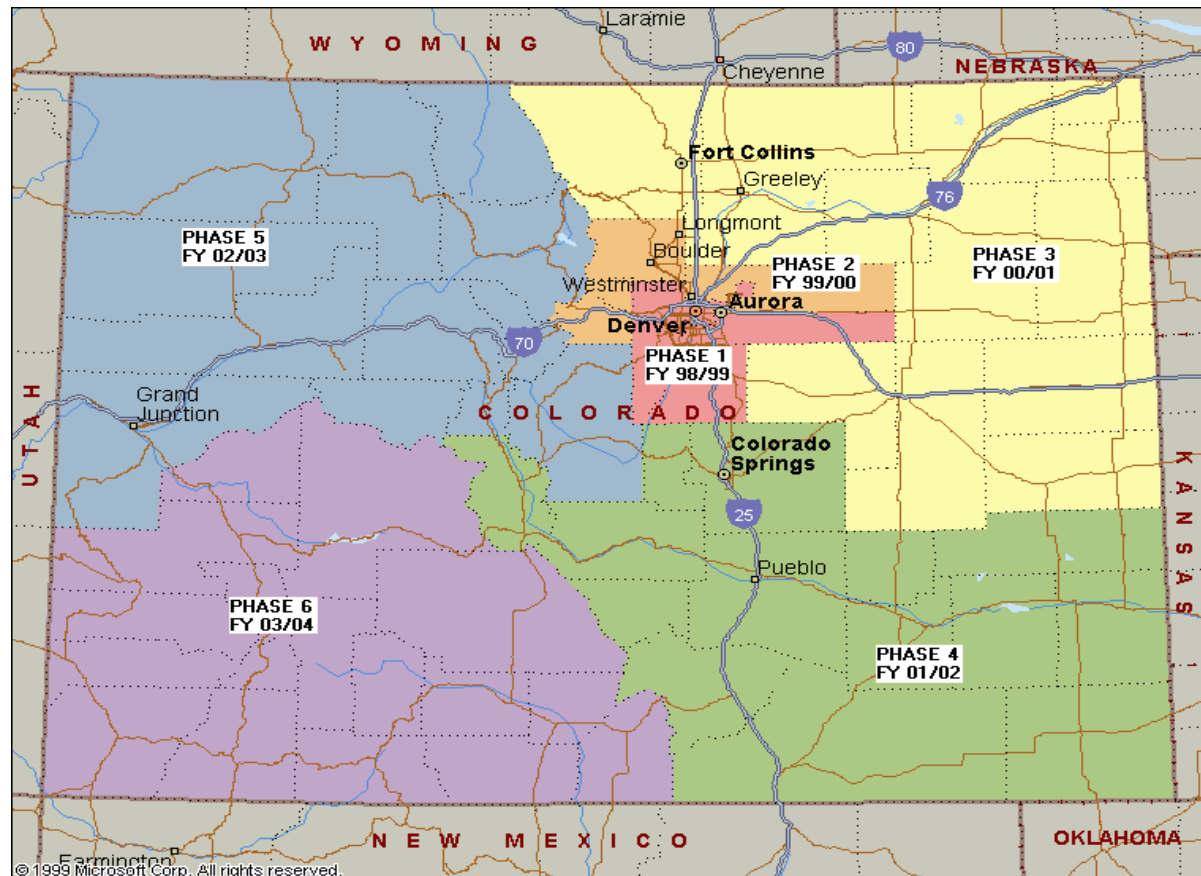


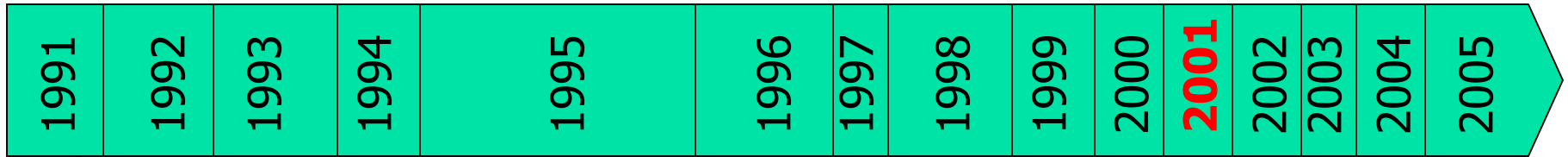
Phase 1 (Pilot) Tower Sites



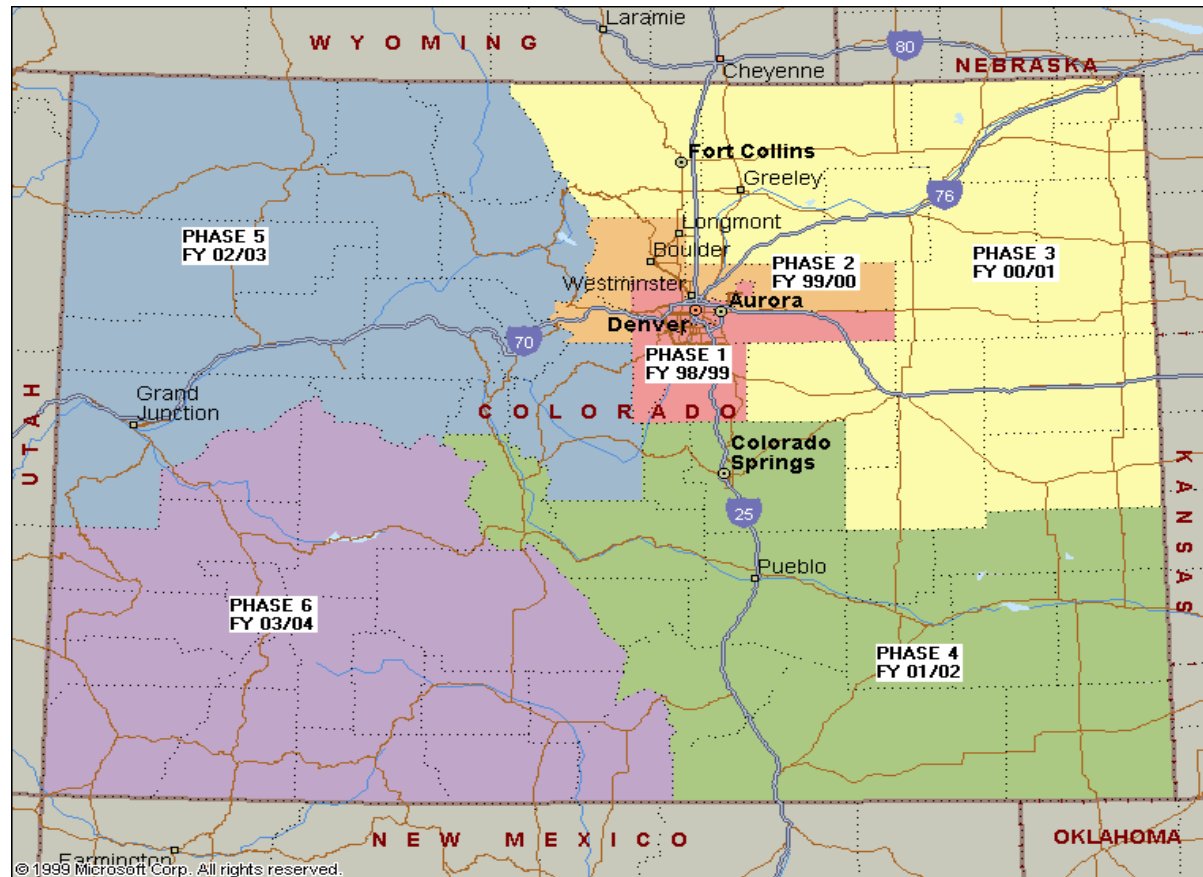


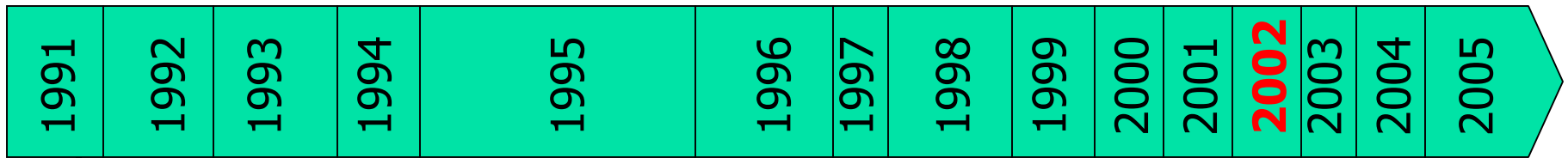
Phase 2 Completed June 2000



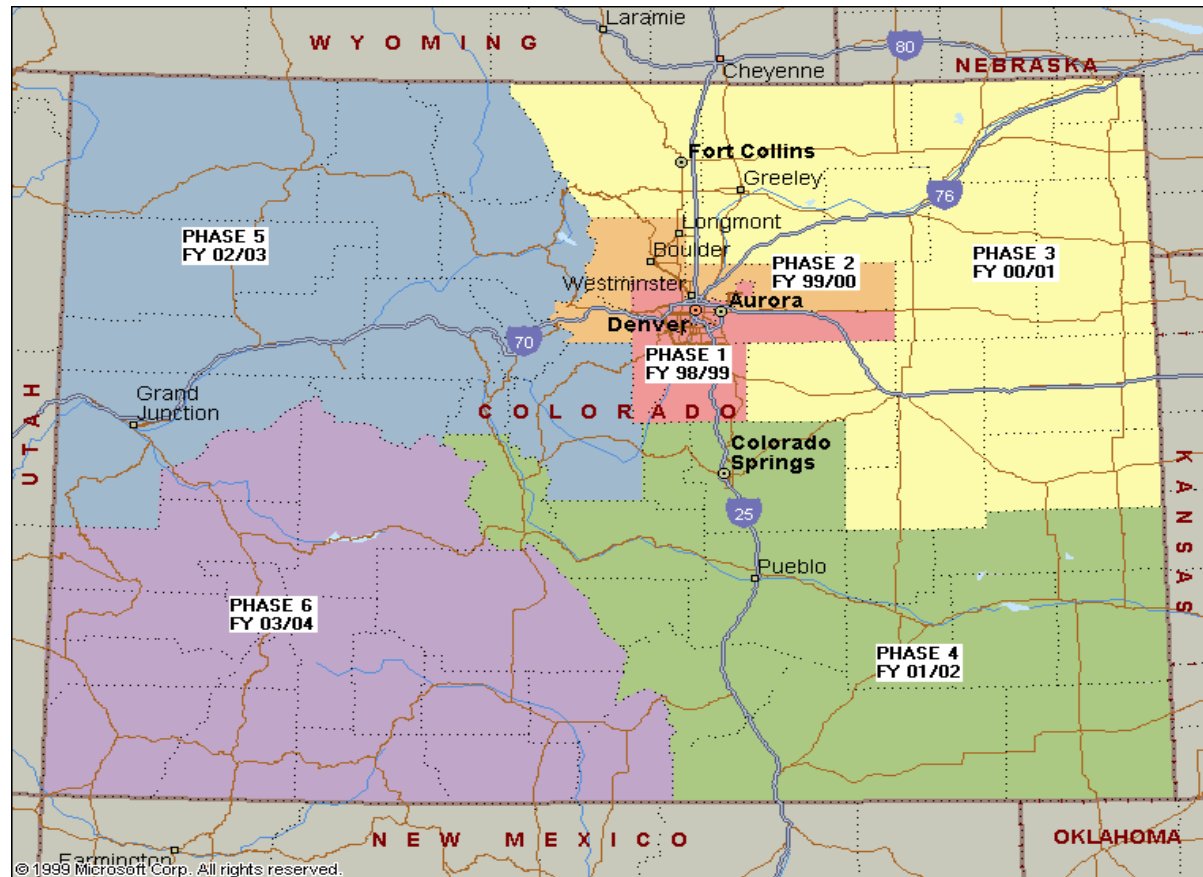


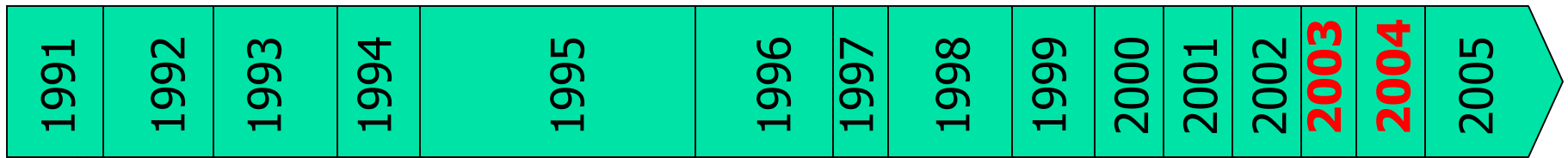
Phase 3 Completed June 2001





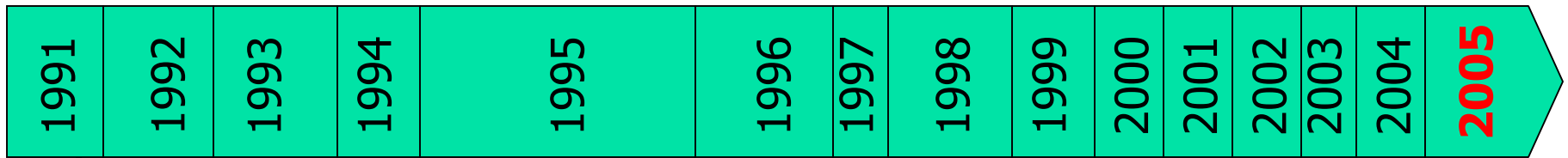
Phase 4 Completed June 2002





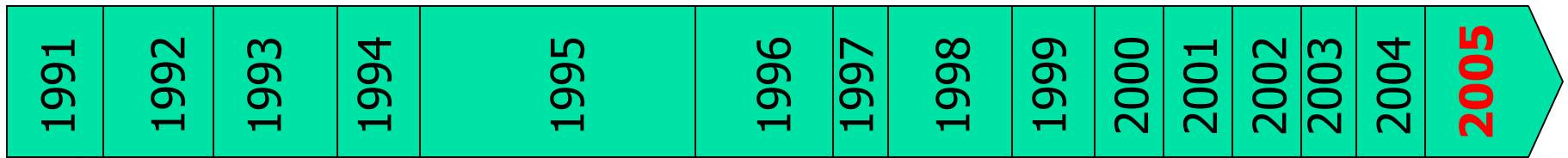
Department of Homeland Security Grants

- 2003 Grants for DTR
 - DHS \$1,497,600
 - UASI \$1,239,000
 - COPS \$993,5000
- 2004 Grants for DTR
 - DHS \$570,000
 - UASI \$664,000



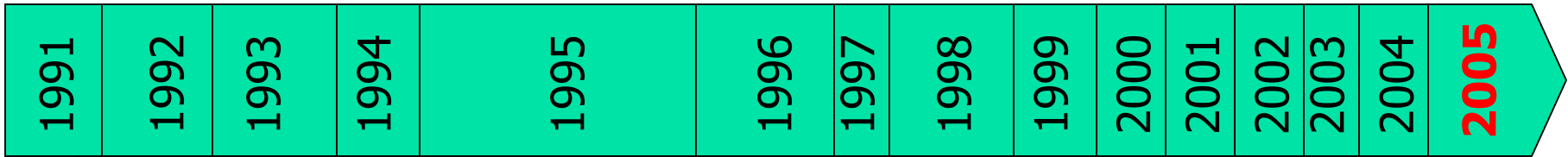
San Luis Valley Completed

- Infrastructure installed (4 sites)
- CSP communications center upgraded
- All State and local agencies converted



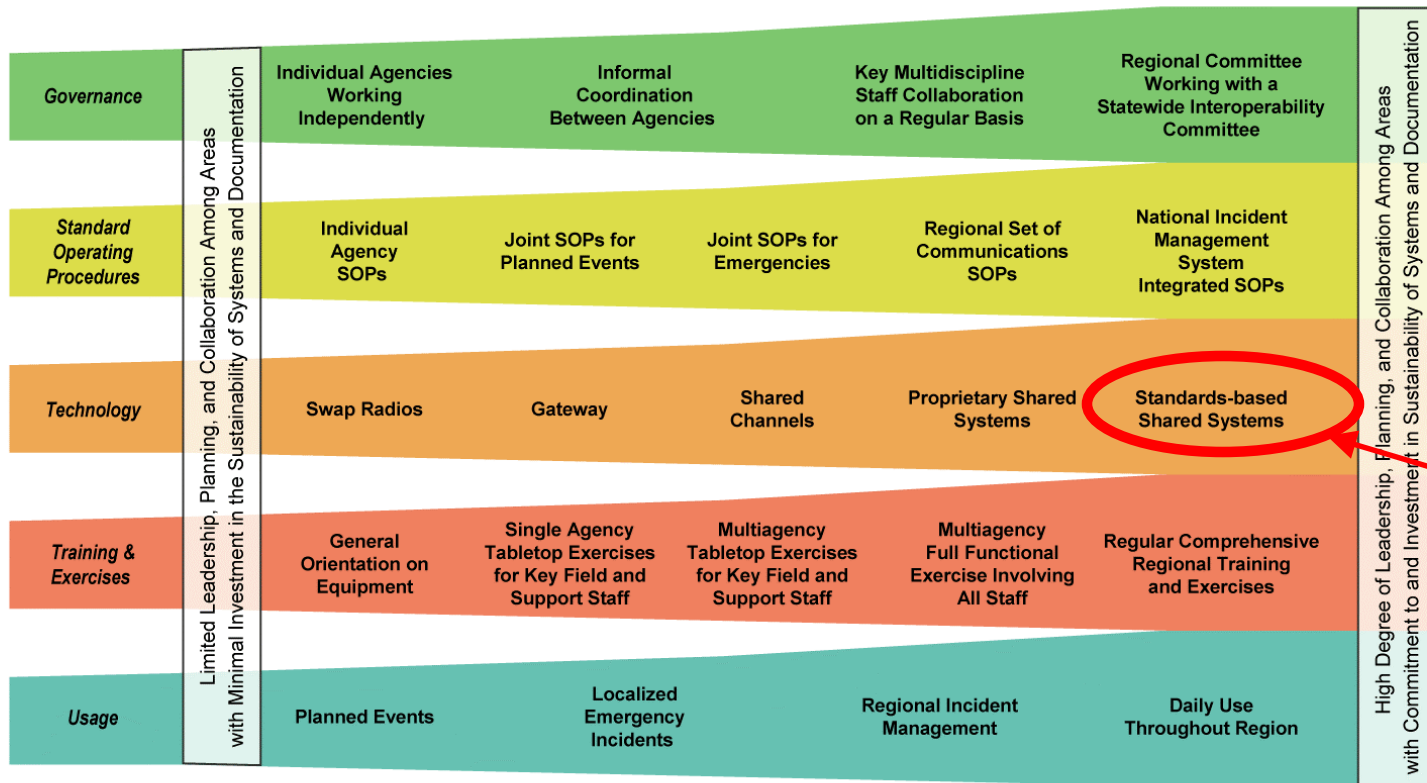
DOLA WIN Grants

- Energy & Mineral Impact Assistance Fund
- Wireless Interoperability Network
- \$13 Million available to local governments
- Goals
 - Improve local & State communications network in rural areas
 - DTRS infrastructure, microwave towers and site equipment
 - Improve radio communications in areas currently undeserved by DTRS
- Projected application will be @ \$25-30 million



**Homeland
Security**

Interoperability Continuum



DTR

Minimal
Level



Optimal
Level